भारतीय मानक
Indian Standard

IS 2727 : 2022

मनीला और सीसल के रेशे के द्विचर मिश्रण की मात्रात्मक रासायनिक विश्लेषण के लिए विधि

(पहला पुनरीक्षण)

Method for Quantitative Chemical Analysis of Binary Mixture of Manila and Sisal Fibres

(First Revision)

ICS 59.060.01

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Chemical Methods of Test Sectional Committee, TXD 05

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textiles Division Council.

This standard was originally published in 1964. The first revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Apparatus as per the testing procedure has been updated; and

b) References to Indian Standard has been updated.

Two or more different types of fibres are mixed with one another for producing a variety of textiles; such a mixture may be composed of different types of man-made fibres or different types of natural fibres or both. The composition of mixture of textile fibres is governed by the ultimate use to which the textile materials are to be put.

Mixtures of textile fibres are being increasingly used for different purposes. The use of the different fibres in textile mixture has necessitated the formulation of standard methods for identification and quantitative estimation of fibres in mixtures. For the textile technologists as well as the trader and the consumer, the quantitative analysis of textile fibres in mixture is of considerable importance.

At present, binary mixtures are very widely used. This standard prescribes a method for the quantitative chemical analysis of binary mixture of manila and sisal fibres. Separate standards have been formulated for other types of mixtures.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’.

Indian Standard

METHOD FOR QUANTITATIVE CHEMICAL ANALYSIS OF BINARY MIXTURE OF MANILA AND SISAL FIBRES

(First Revision)

1 SCOPE

This standard prescribes a method for the quantitative chemical analysis of binary mixture of manila and sisal fibres in any form, such as fibre, yarn, rope or fabric.

NOTE — Before conducting an analysis according to this method; the fibres present in the mixture should be identified (*see* IS 667) and the sample to be analysed should be free from all added and non-fibrous matter.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 PRINCIPLE

A sample of the mixture is dried and weighed. The sample is treated with calcium hypochlorite solution for 10 min. Bright colours are developed on fibres, deep orange on manila fibres and lemon yellow on sisal fibres. Using the difference in colour, the components are separated in wet condition and dried. The weight of manila component in the sample is determined and the proportion of manila fibres in the sample is calculated.

4 SAMPLING

4.1 Sample for determining the percentage by weight of manila or sisal fibres in a lot of textile material which is a mixture of manila and sisal fibres shall be selected so as to be representative of the lot.

4.2 Sample drawn in compliance with an agreement between the buyer and the seller to evaluate the percentage by weight of manila or sisal fibres in a textile material which is a mixture of manila and sisal fibres shall be held to be representative of the lot.

5 ATMOSPHERIC CONDITIONS

The test shall be conducted in ordinary room conditions.

NOTE — Since dry weights are determined it is not necessary to condition the sample.

6 PREPARATION OF TEST SPECIMEN

6.1 If the sample under analysis is yarn or fibres, draw from the different portions of the test sample 3 or 4 tufts, each weighing about one gram. Cut the yarn or fibres so obtained into small pieces of 10 to 15 mm in length and mix them well. Draw at least three test specimens, each weighing about 0.5 g.

6.2 If the sample under analysis is rope or fabric, cut out from the different portions of the test sample 3 or 4 pieces each weighing about one gram. Dissect these pieces into yarn and cut the yarn so obtained into small pieces of 10 to 15 mm in length and mix them well. Draw at least three test specimens, each weighing about 0.5 g.

7 APPARATUS

7.1 Beakers, of 250 ml capacity.

7.2 Ventilated Oven, for drying samples at approximately 105° to 110° C.

7.3 Conical Flask, of 250 ml capacity, fitted with cold finger condenser.

7.4 Soxhlet Apparatus

7.5 Analytical Balance, with a resolution of 0.1 mg.

7.6 Stop-watch, reading correct to one-tenth of a second.

8 REAGENTS

8.1 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water or distilled water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the experimental results.

8.2 Calcium Hypochlorite Solution, containing 3.5 g of available chlorine per litre.

8.3 Nitric Acid, 5 percent (*w/v*),

8.4 Ethyl Alcohol

9 PROCEDURE

9.1 Take one test specimen drawn as in **6.1** or **6.2**. Extract the test specimen with ethyl alcohol or any other suitable solvent in Soxhlet apparatus to remove all oily matter present (*see* Note). Put the extracted test specimen in a beaker and boil it with water for 30 min. Remove the pieces of test specimen from the beaker and dry them at 105° to 110 °C.

NOTE — Generally eight extractions are necessary to remove all the oily matter.

9.2 Take in a conical flask about 150 ml of nitric acid and heat it to boil. Put all the dried pieces into the conical flask and place immediately on the conical flask a cold finger condenser. Boil the contents of the flask exactly for two min. Remove the condenser and wash thoroughly the pieces with water till all the traces of acid are removed.

9.3 Divide the washed test specimen into two or three smaller parts. Put each part into 250 ml beakers and treat each part with calcium hypochlorite solution (*see* **8.1**) with the material to liquor ratio of about 1 : 100. Shake the contents of each beaker at intervals for 10 min. Decant the liquid after distinct bright colours are developed on fibres (*see* Note 1). Wash the fibres with distilled water. Separate the two components in each part in wet condition. Mix all manila fibres and sisal fibres separately obtained from the different smaller parts. Dry the components separately at 105° to 110 °C to constant weight (*see* Note 2) and weigh them accurately.

NOTES

l After the treatment deep orange and lemon yellow colours are developed on manila and sisal fibres respectively.

2 While drying, the components are checked for complete separation.

9.4 Calculate the percentage, by weight, of manila fibre in the test specimen by the formula given below:

Percentage by weight, of manila fibres in the test specimen =

$$\frac{W_1}{W_1 + W_2}$$

where

W_1 = oven dry weight of manila fibre, and

W_2 = oven dry weight of sisal fibres.

NOTE — The loss sustained in chemical treatments is practically same for both the manila and sisal fibres when the test specimen is treated as in **9.1** to **9.3**.

9.5 Repeat the procedure prescribed in **9.1** to **9.3** with the remaining test specimens. Calculate the percentage, by weight, of manila fibres in each case from the formula given in **9.4**.

9.6 Calculate the average of the values obtained in **9.4** and **9.5**.

10 REPORT

Report the average of the values as obtained in **9.6** as the percentage, by weight, of manila fibres in the lot.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
667 : 1981	Methods for identification of textile fibres (including supplement) (*first revision*)
1070 : 1992	Reagent grade water — Specification (*third revision*)

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Chemical Methods of Test Sectional Committee, TXD 05

Organization	*Representative(s)*
The Synthetic and Art Silk Mills Research Association, Mumbai	Dr Manisha Mathur (***Chairman***)
Ahmedabad Textile Industry’s Research Association, Ahmedabad	Shrimati Deepali Plawat Shri Jigar Dave (*Alternate*)
Bidhata Industries Pvt Ltd, Mumbai	Shri Rohit Pacheriwala R. K. Pacheriwala (*Alternate*)
Directorate General of Quality Assurance (CQAT & C), Kanpur	Shri Anuj Kumar Shukla Shri S. J. Kolarkar (*Alternate*)
Global Organic Textile Standard, Thane	Shri Rahul Bhajekar Shrimati Prachi Gupta (*Alternate*)
ICAR- Central Institute for Research on Cotton Technology, Mumbai	Dr Sujata Saxena Dr A. S. M. Raja (*Alternate*)
In Personal Capacity	Shri B. S. Acharya
Intertek India Private Limited, Mumbai	Shri Narayan B. Borade Shri Milind R. Marathe (*Alternate*)
Northern India Textile Research Association, Ghaziabad	Dr M. S. Parmar Dr A. A. Ansari (*Alternate*)
Office of the Textile Commissioner, Mumbai	Shri Gaurav Gupta Shri Sanjay Charak (*Alternate*)
Raymonds Ltd, Mumbai	Shri Prabhat Parasher Shri Saurav Shekhar (*Alternate*)
Reliance Industries Ltd, New Delhi	Shri M. S. Verma Shri Mahesh C. Sharma (*Alternate*)
S G S, Mumbai	Dr Karthikeyan K. Shri Michael Francis (*Alternate*)
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Sunil Industries, Mumbai	Shri Pradeep Roongta Shri Ramesh Khanna (*Alternate*)
Testtex India Laboratories Pvt Ltd, Mumbai	Shrimati Meeta Shingala Shri Mahesh Sharma (*Alternate*)
Texanlab Laboratoires Pvt Ltd, Navi Mumbai	Shri Milind R. Marathe Shri Vivek Patil (*Alternate*)
Textiles Committee, Mumbai	Shri Kartikay Dhanda Dr P. Ravichandran (*Alternate*)
The Bombay Textile Research Association, Mumbai	Shri M. P. Satyanarayan Shrimati Saroj Vairagi (*Alternate*)
The Synthetic and Art Silk Mills Research Association, Mumbai	Shrimati Ashwini A. Sudam Shrimati Leena Mhatre (*Alternate*)
U P Textile Technology Institute	Dr Arun Kumar Patra Dr Subhankar Maity (*Alternate*)

Organization	*Representative(s)*
Venture Instrumentation Technologies Pvt Ltd, Bengaluru	Shri Vishal Vijay Babu Shri Nagaraj C. (*Alternate*)
Wool Research Association, Thane	Dr Mrinal Choudhari Shrimati Samita Bait (*Alternate*)
BIS Directorate General	Shri J. K. Gupta, Scientist 'E' and Head (Textiles) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri Dharmbeer
Scientist 'C' (Textiles), BIS

Bureau of Indian Standards

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